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ABSTRACT

The effect of class size reduction on grades and retention was investigated. Class size for second and third graders in a rural school district was reduced from an average of 24 in second grade to an average of 20 students per class and an average of 25 in third grade to an average of 22 per class. The purpose was to investigate whether the provision of more instructional time between teacher and child through class size reduction would increase academic achievement and decrease pupil retention. Comparing year grade averages in mathematics and reading and comparing the retention rates to the previous year's averages and rates were the methods used to evaluate the success of this intervention. Results indicate positive gains in achievement and a reduction in the number of students retained. (Contains 1 table and 18 references.) (SLD)

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Abstract

The effect of class size reduction on grades and retention was investigated. Class size for second and third graders, in a rural school district, was reduced from an average of 24 in second grade to an average of 20 students per class and an average of 25 in third grade to an average of 22 per class. The purpose was to investigate if provision of more instructional time between teacher and child, through class size reduction, would increase academic achievement and decrease pupil retention.

Comparing year grade averages in math and reading and comparing the retention rates to the previous years averages and rates was the method used to evaluate the success of this intervention. Results indicated positive gains in achievement and a reduction in the number of students retained.

The question, "Are smaller classes better than larger classes?" has been debated in the field of education for many years. Research has indicated that small classes or groups working with a teacher or tutor are effective in reaching students at risk and increasing student achievement (Achilles & Finn, 1998). The purpose of this study was to investigate the effect of class size reduction on the grades and retention of second and third grade students in a rural school district.

Nationwide, classroom sizes have decreased from 30 to 25 over the past 40 years, but low socio-economic urban school districts often have overflowing classrooms. The problem will only increase as enrollment is expected to grow by 2 million students over the next ten years. (Toch & Striesand, 1997). The impact of class size on the academic achievement of students continues to be a hot topic of debate among educators. In the 1970's a review of many studies on small class size seemed to indicate that reducing class sizes slightly increased academic achievement. . Suggested class sizes were a maximum of 15 students. The conclusions were questioned because the data included mixed different grade levels, mixed types of classes, graduate seminars and one-on-one tutorials (Viadero, 1995). Finn (1998) reported that in 1989, Slavin compared studies in which classes of less than 20 students were compared to much larger classes. Slavin concluded that the effect was positive but small and did not necessarily continue when the students returned to larger classes. Other researchers have also concluded that reducing class sizes had positive effects in the primary grades and was beneficial for disadvantaged and minority students. (Glass, Chaen, Smith, & Filby, 1982; Robinson, & Wittobols, 1986; Muller, Chase, & Walden, 1988; Finn, 1990). Data was compiled from 800 Texas school districts containing approximately 2.4 million students in a search for a relationship between teacher quality and class size. Researchers concluded that the data supported the theory that student achievement decreased as student/teacher ratio increased for each student when the class size was above an 18 to 1 ratio (Ferguson, 1991).

In response to prior research, project Student Teacher Achievement Ratio (STAR) was implemented in Tennessee. Researchers collected data on 6,500 students and spent $12 million dollars in an attempt to determine if class size reduction does indeed increase academic achievement. The students were kindergartners placed in 330 classes of different sizes. One third had 13-17 students; one-third 22-26 students; and the final third had 22-26 students plus a full-time teacher's aide. The students remained in these classes through the third grade and returned to larger ones beginning in the fourth grade. Test scores of students in the smaller classes were higher than those of kids in the larger classes with 69% of first graders in the small classes passing the state's reading test as compared with 58% of students in the larger groups. Teachers indicated that the students in the smaller classes attended better, asked a lot of questions, and displayed less discipline problems. (Mosteller, 1995; Toch & Streisand, 1997). A follow-up study traced these students as they returned to normal sized classes in the fourth grade and during the continuing years. The students who had been in smaller classes in grades K-3 continued to score higher than their peers who had remained in larger classes. The scores were higher not only in reading and math, but also in science and social studies. Averaged over the four grades the students who had experienced smaller classes gained a little more than eighth percentiles over the other students from larger classes. The gains were consistent for both Reading and Math on the Scholastic Aptitude Test (SAT). The children who were in classes where there was the addition of an aide showed a slight gain, but gains did not carryover when the children returned to regular size classes with and without aides. Also, the implementation of the program in a low Socio-economic district appeared to improve the academic performance of these children by noticeable amounts. (Achilles, Nye, Zaharias, Fulton & Cain (1996). Better grades continued into high school along with less discipline problems and fewer suspensions (Achilles, 1999; Finn & Achilles, 1999 ; Pate-Bain, Fulton, & Zaharias, 1999).

While acknowledging the effectiveness as indicated in the STAR study in Tennessee, researchers are asking the question, "How small should the classes be?" The states of Iowa, Maryland, Minnesota, New York, and Wisconsin implemented initiatives to lower class sizes to approximately 18 students per class. Throughout the 50 states, however, class size varies from district to district. The Department of Education estimated that the average class size nation wide in grades one through three is 22 students and sometimes higher in larger districts and lower socio-economic areas. These reductions have increased the need for more classrooms and more teachers to staff these classrooms. The funding from Congress is helping to fund these buildings and hire these teachers. (Gardner, 1998; Riley, 1998; Finn, 1998; U.S. Department of Education, 1999).

Participating teachers in Wisconsin's class size program Student Achievement Guarantee in Education (SAGE) indicated that smaller classes sizes have enabled them to increase instructional time, have a better knowledge of their students, and have increased the amount of individualized instruction in the classroom. The results have been increased student achievement and a greater feeling of comfort and reward on the part of the teachers (Molnar, 1999).

Another problem is that of appropriate implementation in order not to diminish the values of class-size reduction. Some schools are placing 40 students in one room with 2 teachers or rotating teachers. Reduction of class sizes without higher standards and teacher training also is less effective. Program SAGE has been implemented using a strong curriculum, staff development and accountability, parent teacher agreements and community involvement. (Gardner, 1998)

Based on Tennessee's Project STAR study and Wisconsin's SAGE and the California Research Consortium (CRC) early analysis, Pritchard (1999), published the following Myths and realities concerning class-size reduction:

Myth 1:	Reductions in class size have little impact on student achievement
Reality:	Studies have consistently identified a positive relationship between reduced class size and improved student performance.
Myth 2:	The effects of class-size reduction can only be seen at the kindergarten level.
Reality:	The benefits of class-size reduction are seen in kindergarten and through grades 1-3 and the effects are long lasting.
Myth 3:	The explanations and conclusions of the STAR findings are flawed.
Reality:	A variety of studies confirm the findings of the STAR study.
Myth 4:	There are hundreds of separate studies of the effect of pupil-teacher ratios" on student achievement; only a handful suggests a positive relationships between reductions in class size and improvements in student performance.
Reality:	There is an important distinction between class size, which is the number of students for whom a teacher is primarily responsible and pupil-teacher ratio, which is the number of students per adults in a school (administrators, counselors, etc.). As a result, many studies have not accurately addressed the effect of reduced class sizes.
Myth 5:	While existing studies do show that variations in class size can influence performance, no one has been able to identify the overall circumstances that lead to the positive effects; it is premature to develop federal policy in the absence of this information.
Reality:	The Project STAR study was scientifically designed so that the only variable altered was the size of classes, and was hence able to conclude that smaller class sizes alone do have a positive impact on student achievement. However, to maximize these benefits, effective teaching strategies are needed. Effective teacher research suggests that certain teaching strategies and skills, particularly those that actively engage students in the learning process, lead to improved student learning when combined with smaller classes.

Myth 6:	The implementation of California's class-size reduction initiative demonstrates the negative impact of such efforts.
Reality:	Findings from year one of an ongoing evaluation of the California initiative show positive achievement gains, despite challenges with respect to "overnight" implementation, teacher quality and supply, space constraints and funds for new classrooms.
Myth 7:	Class-size reduction proposals do not address teacher quality, which is one of the most important factors in student achievement.
Reality:	The Class-Size Reduction Program recognizes that both class-size reduction and improvements in teacher quality are necessary to achieve the most meaningful lasting gains in student achievement and to close the achievement gap.
Myth 8:	Class-size reduction efforts in the early grades are expensive in both the short and long term.
Reality:	The cost of implementing smaller class sizes in the early elementary grades can be offset by the resulting decrease in within-grade retention's, reduced high school dropout rates, a diminished need for remedial instruction and long-term special educating services, and increased teacher satisfaction and retention.

It appears that comparisons of classes based on differences in class size favor the utilization of smaller class sizes along with high standards for teachers and curriculum. In the role of school psychologist, the purpose of this study was to investigate the impact of reduced class sizes on the academic achievement and retention of second and third grade students in a rural school district.

Methodology

Subjects

The subjects for this study were second and third grade students enrolled in a small rural school district in the years 1998-99 and 1999-2000. The student population consisted of 50.61% Euro-American, 49.03% African-American, and 0.09% Hispanic origins.

Procedures:

The class sizes for the 1999-2000 school year were reduced from an average of 24 students per class in second grade to an average of 20 students per class and an average of 25 in

third grade to an average of 22 per class. This was done in an attempt to provide more instructional time between teacher and child in order to improve achievement. All classes had teacher aides before and after the reduction.

In the performance of my duties as a School Psychologist, the effectiveness of class reduction size was evaluated through 2 comparisons: (1) a comparison of grade scores in reading and math from the previous year (1998-1999) to the reading and math scores of 1999-2000). The percentage of children scoring 84 or below was the basis of the comparison; (2) a comparison of the percentage of children retained for the years 1998-1999 with those retained in 1999-2000.

Results

YEAR	SUBJECT	PERCENT ACHIEVING BELOW THE 85% LEVEL
1998-1999	Reading (2nd Grade) Reading (3rd Grade) Total:	24% 28% 26%
1999-2000	Reading (2nd Grade) Reading (3rd Grade) Total:	17% 22% 19%
1998-1999	Math (2nd Grade) Math (3rd Grade) Total:	18% 23% 21%
1999-2000	Math (2nd Grade) Math (3rd Grade) Total:	21% 16% 18.5%
YEAR	PERCENTAGE PASSED	PERCENTAGE RETAINED
1998-1999	94%	6%
1999-2000	95%	5%

The results indicated significant gains in reading and math achievement, consistent with prior research on class reduction. Seven percent more students scored above 84 (81%) for the school year in reading, 1999-2000, as compared to 74% in the year 1998-1999. In the area of Math 2.5% more students scored above 84 for the school year 1999-2000 in math (81.5%) as

compared to 79% in the school year 1998-1999. It should be noted that second grade students did not show improvement in the area of Mathematics. It is felt that this may be attributed to the implementation of a new curriculum not based on prior math curriculum experiences in first grade. There was a significant gain in achievement in math for third grade students (7%).

The results also indicated a reduction in the number of students retained. One percent fewer students were retained in the school year 1999-2000 (5%) as compared to (6%) in the school year 1998-1999.

Conclusions and Recommendations

It appears that reduction of class size has significantly impacted the math and reading achievement of second and third graders in a rural school district. It also appears that smaller class sizes have reduced retention rates. It is recommended that not only maintenance of small classroom sizes continue, but that the class sizes be reduced even further based on prior research. It is also recommended that class sizes be reduced in Kindergarten and first grade.

This study could have been improved through using a more detailed statistical analysis of student results and the use of a larger sample, had it been available. Future research could possibly address the impact of smaller class sizes on students at risk, teaching practices which would be more effective in small classes, school size and classroom conditions, small classes as predictors of positive academic achievement, and cost versus benefit.

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